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**ABSTRACT**

While avoiding evaluation or specification of individual companies, computer time-sharing commercial contract agreements are analyzed. Price and non-price contract elements are analyzed according to 22 evaluation criteria: confidentiality measures assumed by the vendor; consultation services available; package programs and user routines; languages supported by the system; availability and nature of documentation and user manuals; availability of instruction and training; existence of syntax check prior to compilation; advance notice of systems change; physical limitations of the programs; availability of storage; user file structure requirements; delay for user owned tape/disk mounts; number of users on the system; peripheral services; availability of immediate telephone assistance; availability of systems time; telephone network and location of computing equipment; back-up systems and excessive delays; systems crash recovery procedures; possibility of benchmark tests; preventative maintenance procedures; and history of the vendor, up-time, and customer references. A formula is presented for comparison of computer time costs.  
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ANALYSIS OF TIME-SHARING CONTRACT AGREEMENTS  
WITH RELATED SUGGESTED  
SYSTEMS EVALUATION CRITERIA

by

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**Analysis of Time-Sharing Contract Agreements With  
Related Suggested Systems Evaluation Criteria**

**Jo Ann J. Chanoux**

Introduction:

The intent of this data analysis is to examine contract agreements for a commercial service -- in particular, computer time-sharing. The data presentation is not intended to reflect a judgemental element upon those companies supplying information, nor the value of their contracts.

A section of the paper entitled "Suggested Evaluation Criteria" discusses considerations, supplemental to costs, which are pertinent in the decision-making process of the selection of a time-sharing contractor or contractors.

It is my hope that the results of this study will be of interest to students of marketing in exploring contracts - a critical part of the lease-buy function-and in the unique cost-pricing situation which exists in the time-sharing industry. Computer science students, too, are interested in computer pricing issues, and it is hoped that they will derive some additional insight into the nature of computing considerations which are written into formal computer agreements.

The analysis grew from eighteen time-sharing contracts primarily obtained through mailed requests of a number of time-sharing vendors. Those companies responding to the request were extremely willing to provide information; many offered information beyond the scope of this study. I extend my appreciation to those firms for their co-operation.

Every effort has been made in the analysis to preserve respondent anonymity, as the intent of the study was not to compare vendor systems nor services -- that is not possible from such limited information.

Wording in the analysis was not extracted from any vendor contracts although some phrases may be similar to those in the contracts due to contract terminology standardization.

I am especially grateful for the time of Professor Phillip J. Scaletta (see also bibliography) for his assistance in the interpretation phase of the study, and for his suggestions regarding format. Mr. Michael J. Goodrich, currently a doctoral student at the University of Michigan, formerly time-sharing manager at The Upjohn Company, provided much insight and many valuable comments related to evaluation criteria.

Additionally, Professor Frank M. Bass of the Department of Industrial Administration and Professors Maurice Halstead and Samuel Conte of the Department of Computer Science were helpful in their commentary and encouragement in the preparation of the analysis for general distribution. Responsibility for any errors or omissions remains with the author.

Contract Analysis:

In an interview with the presidents of three time-sharing firms in 1972 (Tymshare, Rapidata, National-CSS), a Datamation reporter wrote that the expected growth of the time-sharing or network information services industry will be minimum of 30-40% annually. Although in-house time-sharing resulting from systems capabilities of equipment like the IBM S/370 reportedly had reduced some of the time-sharing service house volume, minicomputers were not thought to be a threat to the time-sharing industry. The advantage of time-sharing over minicomputers were thought to be due to the need for complexity of files, programs and data that are beyond the capabilities of minicomputers.<sup>11</sup>

The 30-40% growth estimate might be a speculative figure; however, the time-sharing industry is of growing interest in the computing industry and to other businesses. Time-sharing provides access to high powered computing equipment where a firm's computing needs may fluctuate significantly and therefore not warrant the purchase of equipment or where cost considerations might be limiting to smaller firms.

The time-sharing contract agreement is the binding agreement between the time-sharing company (hereafter termed the "vendor") and those firms subscribing to time-sharing services (hereafter termed the "customer" or "subscriber"). Although many contracts provide for a thirty day cancellation option, it is assumed that the customer's intent is to have a long-term valuable relationship with that vendor (or vendors) offering services compatible with customer needs.

As reported in the analysis section (Section A), there is extreme variation in the contract agreements, this variation is especially obvious in the pricing schemes. The contract analysis serves to summarize the major terms of the time-sharing agreements, and explores the price-cost variations. For those firms anticipating the utilization of time-sharing services, this analysis may serve to eliminate some confusion suggested by extreme variations, and/or to conjecture a rationale for the variations.

Contract Issues:

Some contracts consist of a single page with a minimum of standardized wording and significant space for information to be completed "as agreed." Others were multi-part, multi-page documents addressing a number of issues. In examining the contracts and attachments, two major categories appeared: (1) pricing issues and (2) non-price issues. The major price or cost issues were:

- Conversational computing rates
- Batch computing rates
- On-line data storage
- Off-line data storage
- Initiation fees
- Minimum monthly fees
- Discount schedules
- Service fees

The major non-price issues were:

- Availability of systems time
- Limitations of liability
- Suits of action limitations
- Term of agreement
- Cancellation option
- Price change notification
- Payment terms
- Number of terminals
- User numbers
- Contract assignment
- Equipment
- Fair Labor Standards Act
- Warranty
- Service implied by contract
- Statement of waiver or breach
- Customer responsibility
- Special programs prepared for customer
- Proprietary programs
- Applicable state of law
- Manuals and documentation
- File security
- Excusable delays
- Systems improvements
- Terms and definitions



Prices and Costs:

Because of varying computer structures, and the numerous forms that computer processing approaches can assume, the determination of total cost to the user is not a matter of simple calculation. Contract terminology for a basic chargeable unit of time includes "systems second", "computer resource unit", "systems hour", "systems time", and numerous acronyms. To determine a charging scheme, a potential subscriber would wish to request the actual formula for price computation -- asking specifically what constitutes a "basic chargeable unit" of time. Additionally, the subscriber would consider the price ranges for various priority levels (time or volume). For example, the number of priorities (hence rates) varies from one to seven for batch rates of different vendors.

As shown in Section A, there are significant differences in time-sharing pricing schedules -- aggregating the data (for the purpose of vendor anonymity) loses some of the impact of that variation.

For those experienced in the computing field, the price variations could raise a question regarding the most accurate method to employ in the computation of total costs; for those inexperienced in computer processing, the price variations could be confusing and misleading. Regardless, the total cost computation (prior to the computer run) appears to be a formidable task using the pricing schedules as the only source of information.

Consider the time-sharing company "Vendor-1" whose stated per second CPU rate is 20% greater than that of "Vendor-2". The

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implication could be that the total costs of a conversational computer run with Vendor-1 would be 20% greater than those of Vendor-2. At the "per-second" level, the significance of cost differential might be questioned, but at the "per-hour" level (not an unlikely computational volume over a period of weeks for a substantial user), that cost differential blossoms into hundreds of dollars!

However, before Vendor-1 can be implicated as a "higher priced" firm, the potential customer must consider a complex set of issues: total cost is a function of (1) connect rate, (2) CPU rate and, in some instances (3) a separate input-output (I/O) rate. (To compound the issue still further, a user considering file storage and/or additional services would need to add costs for storage volume, mounting (for off-line files), media rental, and various services.)

Extending the "simple" case (conversational computing without supplemental costs) -- connect rate is a function of a number of considerations including number of users logged into the system, average system response time, the vendor queuing scheme, programmer "think" time, and character transfer rate. The CPU rate can vary with considerations including processor speed, processor capacity and capability, and the vendor's job scheduling scheme.

Total costs would be computed by the formulation:

$$TC = \sum_{i=1}^k C_i$$

TC = Total Cost

$C_i$  = cost consideration  $i$

$k$  = number of cost considerations per vendor

A specific total cost computational formula could be posed as:

$$TC = \left[ (CON * t_1 + CPU * t_2 + \left\{ \begin{smallmatrix} 1 \\ 0 \end{smallmatrix} \right\} * I/O * t_3) * Pri \right]$$

where:

TC = total cost

CON = connect rate

CPU = processor rate

I/O = input/output rate  $\left\{ \begin{smallmatrix} 1 \\ 0 \end{smallmatrix} \right\}$  where applicable

$t_1$  = connect time

$t_2$  = CPU time

$t_3$  = I/O time where applicable

Pri = priority factor when rate differs

\* = multiplication notation

and:

$$t_1 = fn ( ct_1 , ct_2 , ct_3, \dots, ct_n )$$

$$t_2 = fn ( pt_1 , pt_2 , pt_3, \dots, pt_m )$$

where:

{ct} is the set of connect time considerations

$ct_1$  = number of users logged on the system

$ct_2$  = average system response time  
(can be a function of  $ct_1$ )

$ct_3$  = queuing scheme

.

.

$ct_n$

$n$  = number of connect time considerations

{pt} is the set of processing time considerations

$pt_1$  = job scheduling formula

$pt_2$  = processor speed

$pt_3$  = processor capability

.

.

.

$pt_m$

m = number of processing time considerations

Therefore, without consideration of all these issues, it would be difficult to determine if Vendor-1 were a higher priced firm; it could in fact, be lower!

What is the solution? With so many unknowns (particularly the connect time and processing time considerations) it would be an almost impossible task to determine an exact total cost figure. In defense of the vendors, because there are many factors unknown to them -- number of subscribers logged into the system at any future time, customer programmers "think" time, nature of customer programs -- it would be difficult (if even possible) for the vendor to state a precise cost.

Vendors should be able to forecast a reasonable cost estimate if customer program parameters are provided. Alternatively, a method typically employed to gain estimates of running time and hence costs is the benchmark test (actually running sample programs on the vendor systems). No vendor participating in this study discusses the policy toward benchmark tests. If the benchmark method were employed, the most reasonable estimate would be gained by running the programs

at a time the user expects to be logged onto the system.

The cost summary in Section A is intended to present two issues (1) the "average" prices of computer time sharing services and (2) to exemplify the pricing variations (justifiable perhaps in the considerations discussed here).

Non-cost Issues:

The non-cost issues are presented in the latter portion of Section A.

SUGGESTED EVALUATION CRITERIA:

While costs are of concern to time-sharing customers, the final decision in favor of a particular vendor could rest upon non-cost issues. Consideration of these issues would depend upon customer needs and priorities. Evaluation criteria can have a direct or indirect effect on costs and have intrinsic value as well. In the following summary, order is not intended to reflect the importance of the issue.

(1) Confidentiality Measures Assumed by the Vendor:

Confidential data is a concern of many business firms. Accounting data and financial data is typically considered confidential data, yet lends itself most readily to computer application. When computer processing and data handling is not within full control of the user, confidentiality is an especially critical issue.

(2) Consultation Services Available:

Consultation services include programming assistance, systems analysis, data base design, or assistance in computer utilization. This feature is especially important for firms with minimal experience in computer processing.

(3) Package Programs and User Routines:

Many firms offer standardized programming "packages" for the general use of their customers. Examples of package programs includes payroll processing, project time analysis,

and accounting applications, such as general ledger.

Charging policies vary across vendors as discussed previously.

(4) Languages Supported by the System:

This feature could require additional training for firms with computer personnel experienced with programming languages not supported by a vendor system. Additionally, programs written in languages not supported by the vendor system would need revision.

(5) Availability and Nature of Documentation and User Manuals:

To utilize a computer system, the customer must have current, accurate, and complete information for procedures. Typically this information is contained in one or a series of manuals termed "user" manuals or "documentation." "Documentation" may also include detail related to the vendor's system design and/or programs.

(6) Availability of Instruction and Training:

Some firms offer formal classes at scheduled intervals for their customers. Other firms may offer special tutorials for individual client personnel.

(7) Existence of Syntax Check Prior to Compilation:

This feature of time-sharing languages could save considerable time and expense when diagnostic messages are provided to the programmer prior to program compilation.

(8) Advance Notice of Systems Change and Period of Continuation of Former Procedures Following a Change:

Many vendor contracts address the problem of systems changes

with regard to advance notice required. The critical consideration is maintenance of former procedures to allow ample time for routine processing prior to integration of new procedures or changes in user routines.

(9) Physical Limitations of the Programs:

This is significant for customers anticipating large programming efforts. With an "upward" size limitation (program cannot exceed a specified size) the restriction would not necessarily result in a decision to seek the services of another vendor, but could result in systems design considerations such as program segmentation.

(10) Availability of Storage -- On-line and Off-line:

The user would consider the availability of space for expected current needs and for projected or estimated future storage requirements.

(11) User File Structure Requirements:

To develop files which are compatible with the vendor system, customers must have access to information regarding file organization. The requirement of file re-organization for currently existing files is of interest to potential customers.

(12) Delay for User Owned Tape/Disk Mounts:

Cost considerations for user owned tape or disk mounts are discussed in Section A. The time delay for file mounting could significantly affect the charges for terminal connect time.



(13) Number of Users on the System:

The number of users attempting to access the system at any one point in time could never be known with certainty, but "potential" users are a function of the number of subscribers (customers) to the vendor system.

(14) Peripheral Services:

"Peripheral services" refers to services supplemental to conversational and batch computing. Peripheral services include keypunching, verification, off-line printing, file duplication, and delivery of materials.

(15) Availability of Immediate Telephone Assistance:

Some vendors provide an "emergency" telephone number to users. This number is available for consultation of specific problems arising during the time-sharing computing process.

(16) Availability of Systems Time:

Vendors providing contracts to this study offer time-sharing services during the regular business day with some time extending through the evening and weekends. Some vendors have special rates for "off" hours or non-priority time.

(17) Telephone Network and Location of Computing Equipment:

The primary interest of the customer in network structure and hardware location is the determination of line charges, transfer rates, and related issues.

(18) Back-up Systems and Excessive Delays:

Liability for excessive delays is discussed in some vendor

contracts (Section A - Non-Cost Issues), but few specify the nature of the back-up systems if these systems exist.

(19) Systems Crash Recovery Procedures:

Many vendors provide for recovery of data and data storage media in the event of negligence on their part. Regardless of the nature of the failure, the user would still have interest in systems crash (failure) recovery procedures.

(20) Possibility of Benchmark Tests:

Benchmark tests were suggested as an alternative to obtaining an estimate of running time and computational costs. The user would be interested in the vendor policies toward running benchmark tests, particularly at the time the customer anticipates systems utilization.

(21) Preventative Maintenance Procedures:

One vendor mentioned preventive maintenance in the contract agreement. The user would be interested in time scheduled for preventive maintenance in addition to maintenance policies.

(22) History of the vendor, Up-time and Customer References

Vendors should be willing to provide this information upon request.

The previous list is not intended to be exhaustive. For example, other criteria suggested in the computer literature is:<sup>5</sup>

Time to insert a request  
Response time of the system  
Average waiting time  
Average length of the queue  
Overhead time  
Swap time  
Memory utilization  
Processor utilization  
Resident library utilization  
Channel utilization.

Evaluation Criteria in the Contract Agreements:

The exhibit on the following page indicates the number of contracts which contain references to the evaluation criteria presented on the previous pages. It is important to note that not all of the evaluation criteria would logically be written into a contract agreement.

Criteria such as average waiting time and number of users logged into the system would fluctuate significantly in a relatively short time rendering any contractual reference to those criteria as meaningless.

Because contract contents are frequently thought to contain the most pertinent issues related to a lease-buy agreement requiring contracts, the purpose of this section has been to discuss a situation in which very important issues may be omitted from formal agreements yet should be included in the decision-making process.

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## Summary of Evaluative Criteria Discussed in Contract Agreements

| Evaluation Criteria               | Number of Vendors | Not Specified |
|-----------------------------------|-------------------|---------------|
| Confidentiality                   | 11                | 7             |
| Consultation                      | 5                 | 13            |
| Package Programs                  | 11                | 7             |
| Languages                         |                   | 18            |
| Documentation                     | 8                 | 10            |
| Instruction                       |                   | 18            |
| Syntax Check                      |                   | 18            |
| Prior Notice of System Change     | 9                 | 9             |
| Continuation of Former Procedures |                   | 18            |
| Limitations on Programs           |                   | 18            |
| Availability of Storage           |                   | 18            |
| File Structure Requirements       |                   | 18            |
| Delay for File Mounts             |                   | 18            |
| Number of Users                   |                   | 18            |
| Peripheral Services               | 12                | 6             |
| Immediate Telephone Assistance    |                   | 18            |
| Availability of Systems Time      | 8                 | 10            |
| Location of Computer              |                   | 18            |
| Back-Up Procedures                |                   | 18            |
| Systems Delay                     | 11                | 7             |
| Systems Crash Recovery Procedures |                   | 18            |
| Benchmark Tests                   |                   | 18            |
| Preventative Maintenance          | 1                 | 17            |
| History, References               |                   | 18            |
| Time to Insert Request            |                   | 18            |
| Response Time of the System       |                   | 18            |
| Average Waiting Time              |                   | 18            |
| Average Queue Length              |                   | 18            |
| Overhead Time                     |                   | 18            |
| Swap Time                         |                   | 18            |
| Memory Utilization                |                   | 18            |
| Processor Utilization             |                   | 18            |
| Resident Library Utilization      |                   | 18            |
| Channel Utilization               |                   | 18            |
| Costs                             | 12                | 6             |

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**SECTION A**

**Note:** In this section,  
"Not Specified"  
indicates that the  
contract did not  
discuss the issue  
indicated.

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**Cost Issues**

Conversational Computing Rates:

For a detailed discussion of computing rate computation, see pages 6-10. The following figures are computed from twelve vendor pricing schemes.

|         | Connect Rate<br>Per <u>Minute</u> | Connect Rate<br>Per <u>Hour</u> | CPU<br>Rate per <u>Second</u> |
|---------|-----------------------------------|---------------------------------|-------------------------------|
| High    | \$.45                             | \$27.00                         | \$1.00 (high volume)          |
| Average | .221                              | 13.07                           | .186                          |
| Low     | .05                               | 3.00                            | .02                           |

Conversational Computing Rates:

Varying Line Speeds  
(Five Vendor Analysis)

10 Characters Per Second

|         | Connect Rate<br>Per Minute | Connect Rate<br>Per Hour |
|---------|----------------------------|--------------------------|
| High    | \$.215                     | \$13.00                  |
| Average | .17                        | 10.54                    |
| Low     | .108                       | 6.50                     |

30 Characters Per Second

|         | Connect Rate<br>Per Minute | Connect Rate<br>Per Hour |
|---------|----------------------------|--------------------------|
| High    | \$.33                      | \$20.00                  |
| Average | .258                       | 15.58                    |
| Low     | .191                       | 11.50                    |



Batch Rates:

Batch rates or deferred processing denotes processing service in other than a conversational mode. One vendor stated rates as a factor of their conversational rates; others offered a range of priority schedules-- there were as few as three priorities and as many as seven.

Batch Time Available

8

Not Specified

10

Highest Rate Per Hour:

\$1200. (fully dedicated system)

Lowest Rate Per Hour:

\$ 35.

The longest turnaround time stated is a weekend.

Data Storage Costs:

Because of hardware structural differences, it is difficult to derive an equivalent unit of measurement in determining data storage costs. On-line data storage costs are shown below for a "standard" unit of 10,000 characters. These are the rates for "characters" as quoted in the vendor contracts. No attempt was made to define "character" as a specified number of bits; so even these figures may be slightly misleading. The problem of determining costs is further compounded by the vendor requirement for a specified minimum increment of storage (p.24) which varies considerably across vendors. Some vendors provided sliding scales for rates for volume storage.

On-Line Data Storage:  
(10,000 "characters")

|         | Minimum Storage Rate |
|---------|----------------------|
| High    | \$10.00/month        |
| Average | 4.80/month           |
| Low     | 1.00/month           |

Minimum Increments for On-Line Data Storage:

The minimum increments for on-line data storage were quoted in an exact number of bytes, characters, or blocks. Little reference was made to type of computing equipment, hence the exact configuration of a "byte" or "character". Figures shown below are rounded to the nearest thousand.

| Number of Vendors | Minimum Increment |
|-------------------|-------------------|
| 4                 | 1000 characters   |
| 1                 | 1000 bytes        |
| 1                 | 2000 bytes        |
| 1                 | 10,000 characters |
| 1                 | 1000 words        |
| 10                | Not specified     |

Off-Line Data Storage:

Off-line data storage rates were quoted typically for magnetic tapes; a few vendors specified options for disk storage. Several vendors rent and/or sell tapes; there is typically a charge for file mounting and a per-minute charge while mounted.

Disk Pack Storage:

|          | Per Month Fee |
|----------|---------------|
| High:    | \$60.00       |
| Average: | 31.375        |
| Low:     | 25.00         |

Tape Storage:

|          |         |
|----------|---------|
| High:    | \$10.00 |
| Average: | 6.50    |
| Low:     | 3.00    |

File Mounting:

|          | <u>Tape</u> | <u>Disk</u> |
|----------|-------------|-------------|
| High:    | \$10.00     | \$10.00     |
| Average: | 4.75        | 5.66        |
| Low:     | 1.00        | 1.00        |

Discount Rates Allowed:

Discounts are mentioned in the contracts primarily for data storage; some vendors had complex discount schedules. Discounts for data storage ranged from 5% to 70% of the highest data storage cost stated.

Number of Vendors:

Discount:

4

Sliding scale for on-line  
data storage

1

Discounts as agreed

1

Terminal time discount

12

Not specified

Costs of Peripheral Services

"Peripheral services" denotes a wide variety of services other than computing. These services across vendors include off-line data storage, file duplicating, off-line printing, staff services (keypunch, verifying, programming, consultation), and pick up and delivery of data and output.

Off-Line Data Storage

| Specified Available | Not Specified |
|---------------------|---------------|
| 9                   | 9             |

File Duplicating Services

| Specified Available | Not Specified |
|---------------------|---------------|
| 4                   | 14            |

Delivery Services:

| Specified Available | Not Specified |
|---------------------|---------------|
| 6                   | 12            |

The charges varied considerably, from vendor's costs, cost per mile, cost per delivery, a percentage fee, a specified amount per stop.

Staff Services:

| Specified Available | Not Specified |
|---------------------|---------------|
| 5                   | 13            |

Off-Line Printing

| Specified Available | Not Specified |
|---------------------|---------------|
| 8                   | 10            |

Off-line printing charges varied. Typical set-up time was either \$5.00 or \$10.00. Some printing charges were based on number of lines; others were number of pages.

Initiation Fee:

Several vendors require an initiation fee prior to a customer's use of the system for the first time. This fee could be regarded as a deposit (not to be refunded) or a "membership" fee; however, because of costs involved in establishing and storing user account numbers, the fee is likely used for these initial costs.

| <u>Number of Vendors</u> | <u>Fee</u>                    |
|--------------------------|-------------------------------|
| 4                        | \$100.                        |
| 1                        | Fee, but amount not specified |
| 13                       | Not specified                 |

Minimum Monthly Charges:

The majority of the contract received indicated that there was an obligatory charge per month regardless of the extent of computer utilization.

| <u>Number of Vendors</u> | <u>Minimum</u>                      |
|--------------------------|-------------------------------------|
| 3                        | \$100.                              |
| 1                        | Approx. \$400. on one system        |
| 2                        | Unspecified amount                  |
| 2                        | No minimum                          |
| 1                        | \$10. per billing                   |
| 1                        | \$50. when services are<br>utilized |
| 2                        | Remote batch minimum                |
| 1                        | \$1.00 per user account<br>not used |
| 5                        | Not specified                       |



### Non-cost Issues

Availability of Systems Time:

Several time-sharing contract agreements specify hours that the time-sharing system is to be available for customer utilization. Only one specific reference was made to time reserved for system scheduled maintenance.

| <u>Number of Vendors</u> | <u>Available Time</u>   |
|--------------------------|---|
| 1                        | 8 - 8 Mon. - Fri.   |
| 1                        | 8 - 9 Mon. - Fri.<br>8 - 6 Sat. *   |
| 1                        | 8 - 11 Mon. - Fri.<br>8 - 11 Sat.   |
| 1                        | 8 - 8 Mon. - Fri.<br>7 hours on Saturday<br>or<br>8 - 11 Mon. - Fri.<br>8 - 3 Sat. ** |
| 1                        | Minimum 200 hours<br>monthly  |
| 2                        | 24 hours<br>7 days  |
| 1                        | To be agreed  |
| 10                       | Not specified   |

---

\* Central standard time

\*\* Eastern standard time

Limitation of Liability:

Most contracts give some attention to limitations of liability. Since a customer is entrusting his data and his programs to a system and personnel virtually out of his personal control, he would be concerned about recovery of data and/or damages in the event of an accident or through negligence.

| <u>Number of Vendors</u> | <u>Specified Limitation of Vendor</u>                                |
|--------------------------|--|
| 2                        | Responsible for correcting errors.                                   |
| 4                        | One month's average billing* maximum.                                |
| 1                        | Responsible for correcting errors or prices in conjunction with run. |
| 1                        | Responsible for corrections <u>or</u> one month's average billing.   |
| 1                        | "Direct" damages and correction of errors.                           |
| 1                        | Maximum of three month's average* billing.                           |
| 1                        | Charges paid in conjunction with run at price of destroyed media.    |
| 1                        | Documentation only.  |
| 1                        | \$100.00 maximum   |
| 1                        | Direct damages and correction of errors.                             |
| 2                        | <u>Not</u> liable.   |
| 2                        | Not specified.   |

---

\* Average billing is taken over previous twelve months, or as many months subscriber has been enrolled if less than twelve months.

Suits of Action Limitations:

Four vendors provided for suits of action by establishing a time limitation beyond which suits could not be initiated.

| <u>Number of Vendors:</u> | <u>Years Limitation</u> |
|---------------------------|-------------------------|
| 1                         | 2                       |
| 3                         | 1                       |
| 14                        | Not specified           |

Term of Agreement:

The term of agreement clause is concerned with the time frame in which the contract agreement is valid.

| <u>Number of Vendors</u> | <u>Term</u>                     |
|--------------------------|---------------------------------|
| 1                        | To be completed number of years |
| 2                        | To be agreed                    |
| 6                        | 30 days + *                     |
| 1                        | 30 days + or six months         |
| 2                        | Until notified                  |
| 3                        | One year                        |
| 1                        | Monthly                         |
| 2                        | Not specified                   |

---

\* 30 days + billing indicates that the contract is binding for a minimum of thirty days and afterwards binding until a cancellation notice is received from either party. Cancellation notices must be in writing.

Cancellation Option:

"Written notification" was indicated as necessary in contract agreements with cancellation clauses. One contract indicated a specific mode of mailing. Typical reasons indicated for cancellation were desired termination of services, price changes, systems modifications, and customer non-payment.

| <u>Number of Vendors</u> | <u>Term</u>   |
|--------------------------|---|
| 9                        | 30 days advance notice  |
| 1                        | 30 days advance notice<br>10 days for non-payment                             |
| 1                        | 15 days within date of price<br>change<br>60 days advance notice<br>otherwise |
| 1                        | 15 days within date of price<br>change<br>30 days advance notice<br>otherwise |
| 1                        | one month or days of price<br>change  |
| 1                        | on notification of price<br>change<br>30 days advance notice<br>othersise     |
| 1                        | three <u>months</u> notice<br>30 days for non-payment                         |
| 1                        | 30 days for the customer<br>60 days for the vendor                            |
| 2                        | Not specified   |

Price Change Notification:

The price change clause acknowledges the likelihood of future changes from prices specified in the contract agreement. There was no reference regarding the historical price change trends nor any reference to the stability of the current prices.

| <u>Number of Vendors</u> | <u>Advance Notice Prior to Price Change</u> |
|--------------------------|---|
| 9                        | 30 days                                     |
| 1                        | 35 days                                     |
| 3                        | 60 days                                     |
| 2                        | One month                                   |
| 3                        | Not specified                               |

Payment Terms:

Those contracts including specifications for payment terms sometimes included specific remedy for nonpayment (a statement of penalty). Penalty clauses are indicated in parenthesis.

| <u>Number of Vendors</u> | <u>Payment Terms</u>  |
|--------------------------|---|
| 3                        | Due upon receipt of invoice   |
| 1                        | As agreed.  |
| 2                        | "Billing is monthly."   |
| 3                        | Within 30 days of receipt of invoice.   |
| 1                        | Within 10 days of receipt of invoice. (Otherwise vendor has right of cancellation.) |
| 1                        | Within 10 days. (Service charge for outstanding bills).                             |
| 1                        | Charges due on 10th day of the month.   |
| 1                        | Within 10 days. (1-1/2% interest charge per day penalty).                           |
| 1                        | Within 30 days. (1% service charge on unpaid amounts).                              |
| 1                        | Net within 10 days, but 30 day maximum time frame.                                  |
| 3                        | Not specified.  |



Number of Terminals:

Number of terminals installed at one customer installation was specified in only three contracts.

Number of Vendors

Limitation

1

There may be from one to ten terminals per user number. There are no limitations on the number of user numbers at any installation.

2

The customer may install as many user numbers as desired.

15

Not specified.

User Numbers:

Contractual reference to user numbers concerned the costs of changes or additions, storage space, and customer responsibility.

Number of Vendors

Posture

2

Customer responsible for all usage logged under his user number.

1

Customer responsible for all usage logged under his user number; \$1.00 charge for user number change.

1

Customer responsible for all usage logged under his user number; \$10.00 charge for user number change.

1

\$7.50 charge for change or addition in user numbers.

1

Customer pays for user number storage.

1

Vendors will assign user numbers as necessary.

11

Not specified.

Contract Assignment:

Contract assignment addresses the situation of the vendor appointing another firm to satisfy the computer services for the vendor's customers; or conversely, the customer designating their rights to computer services to another company.

| <u>Number of Vendors</u> | <u>Position</u>   |
|--------------------------|---|
| 4                        | Not assignable without written consent.   |
| 3                        | Not assignable without written consent <u>of the vendor</u> .                   |
| 1                        | Vendor may subcontract; not assignable by the customer.                         |
| 1                        | Vendor may subcontract, not assignable by the customer without written consent. |
| 1                        | Assignable by the consent of both parties.                                      |
| 8                        | Not specified.  |

Equipment:

It was rare for a contract to contain any reference to the type of computing equipment utilized in providing time-sharing services. Equipment specified in the contracts concerns communications devices to be located in the customer facility.

| <u>Number of Vendors</u> | <u>Position</u>  |
|--------------------------|--|
| 1                        | May not remove equipment from client offices without vendor consent.                         |
| 2                        | Customer responsible for furnishing model 33 or 35 teletype and appropriate telephone lines. |
| 11                       | Customer responsible for data set terminal equipment, telephone line.                        |
| 1                        | Customer provides <u>devices</u> for data transmission.                                      |
| 4                        | Not specified.   |

Fair Labor Standards Act - 1938

Four vendors specifically indicated within the contract agreement that the Fair Labor Standards Act applied to contractual terms. This clause is intended to specify that the vendor is an equal opportunity employer -- absence of the clause does not imply the reverse.

Warranty:

A typical warranty clause when included in the contract agreement might read as follows, ". . . makes no representations, expressed or implied, and assumes no liability to the customer except . . . ". A warranty is synonymous with a guarantee.

Number of Vendors

Position

5

Makes no representations  
or warranties.

1

Warrants time-sharing services as specified elsewhere in the contract.

1

Warrants the documentation only.

1

Warranties are limited, as specified with attached schedules.

10

Not specified.

Services implied in contract:

Contracts specified the nature of services within the time-sharing agreement.

| <u>Number of Vendors</u> | <u>Services</u>  |
|--------------------------|--|
| 4                        | Computer Services.   |
| 1                        | Information network services.  |
| 1                        | Use of computer system and related services. (no explanation of "related services").                         |
| 1                        | Personnel and machine time.  |
| 1                        | Computer time, software packages, and services of personnel.   |
| 1                        | Computer service, I/O capability, central processor time, program storage capacity, programs, and languages. |
| 1                        | Time-sharing services, auxiliary services, documentation services, consulting services.                      |
| 3                        | Time-sharing services, I/O capability, CPU time, and storage.  |
| 2                        | Time-sharing services, or remote access time sharing services.   |
| 1                        | Personnel and machine time.  |
| 2                        | Not specified.   |

Statement of Waiver or Breach:

| <u>Number of Vendors</u> | <u>Position</u>  |
|--------------------------|--|
| 1                        | Waiver of one provision does not nullify others.   |
| 5                        | Waivers must be in writing and must be duly authorized.  |
| 1                        | Waiver must be in writing.   |
| 3                        | Vendor not responsible to third parties.   |
| 1                        | Breach of contract elements not rectified by the customer within thirty days gives vendor the right of cancellation. |
| 1                        | Modification must be in writing.   |
| 6                        | Not specified.   |



Customer Responsibility Other than Equipment:

| <u>Number of Vendors</u> | <u>Responsibility</u>   |
|--------------------------|---|
| 1                        | To supply data and information for processing which is complete and accurate. |
| 2                        | Will use services only for business use.                                      |
| 3                        | Maintenance of accurate data, customer will have fidelity bond for insurance. |
| 12                       | Not specified.  |

Special Program Prepared for Customers:

Special programs prepared for the customer are programs customized for the customers particular use -- not for all clients or customers general distribution.

| <u>Number of Vendors</u> | <u>Position</u>                                    |
|--------------------------|--|
| 1                        | Customer ownership unless otherwise agreed.        |
| 5                        | Property of the vendor.                            |
| 1                        | To be determined by the vendor.                    |
| 1                        | Special programming is available.                  |
| 1                        | Formal programming agreement with joint ownership. |
| 9                        | Not specified.                                     |

Proprietary Programs:

Proprietary programs are those prepared by the vendor for either vendor utilization or in anticipation of customer demand.

| <u>Number of Vendors</u> | <u>Position</u>  |
|--------------------------|--|
| 3                        | Ownership of the vendor.   |
| 1                        | Surcharge for utilization.   |
| 1                        | Ownership of the vendor-- must be returned upon contract termination.            |
| 1                        | To be treated as confidential data, and shall remain the property of the vendor. |
| 1                        | Charges for utilization.   |
| 1                        | Property of the vendor for <u>use as vendor</u> shall determine.                 |
| 1                        | Customer has unlimited use of those in the vendors catalogue.                    |
| 1                        | Charges, remains vendor's property, customer must accept as is.                  |
| 1                        | To be used only in conjunction with vendor's system.                             |
| 7                        | Not specified.   |

Applicable State of Law

This clause was placed in most vendor contracts to indicate the applicable state of law under which the contract would be interpreted in the event of a suit of action. The reader should note that the applicable state of law does not necessarily relate to the home office location of the time sharing vendor.

| <u>Number of Vendors</u> | <u>State of Law</u> |
|--------------------------|---------------------|
| 4                        | New York            |
| 1                        | New Jersey          |
| 1                        | California          |
| 1                        | Massachusetts       |
| 1                        | Pennsylvania        |
| 1                        | Missouri            |
| 1                        | Texas               |
| 1                        | Minnesota           |
| 6                        | Not specified       |

Manuals and Documentation:

Manuals and documentation refer to the system user manuals and accompanying documentation for both systems and the programming languages. A non-specified position should not necessarily be interpreted as "non-existent".

Number of Vendors

Position

2

Materials provided with the current Price schedule or policies.

2

One set furnished, additional copies may be purchased.

3

Charges for materials

1

Two sets are furnished without charge and are to be returned with cancellation of the service.

10

Not specified.

File Security:

This clause could be related to the liability clause, except that the liability clause is all-encompassing--the file security clause relates strictly to the "protection" of customer provided and/or stored data.

| <u>Number of Vendors</u> | <u>Positions</u>   |
|--------------------------|--|
| 1                        | Will use reasonable efforts to preserve the confidentiality provided the data is identified as confidential material.  |
| 2                        | Will use reasonable security procedures.   |
| 1                        | If the vendor is in violation of not preserving security, the customer has the right to enjoin provided other measures are inadequate.   |
| 1                        | Will use reasonable security procedures; if loss is due to vendor negligence, the vendor is obligated to reconstruct the data files provided the customer can provide the information--this may be at the lowest cost to the vendor. |
| 3                        | Safeguards to the same extent as the vendor's own information.   |
| 1                        | Reasonable security procedures, but specifies no guarantees.   |
| 7                        | Not specified.   |

Excusable Delays:

Delays in performance of contract terms which are considered "excusable" as defined in the contracts are those beyond the control of the vendor such as fire, flood, "Acts of God", war, national disaster.

| <u>Number of Vendors</u> | <u>Position</u>  |
|--------------------------|--|
| 8                        | Not Liable.  |
| 1                        | Customer shall provide its own casualty insurance; vendor not liable.  |
| 1                        | Vendor not considered in default.  |
| 1                        | Vendor is allowed reasonable time to perform, and has the right to apportion service to his customers as deemed equitable. |
| 7                        | Not specified.   |

Systems Improvements:

It can be to the customers advantage to have improvements made to the vendor systems; however, it is frequently necessary to change procedures or programs when systems modifications are made. The systems improvements clause pertains to advance notice in the event of systems change.

Number of Vendors

Position

6

Reserves the right to make changes.

1

Reserves the right to make changes upon reasonable notice to the customer.

1

Thirty days notice must be given prior to systems changes, customer may cancel within fifteen days of the change.

1

Reserves the right to changes-- rules, time of operation, procedures, numbers, languages, type and location of the system.

9

Not specified.



Terminology and Definitions Contained in Contracts:

Terms defined in the contracts typically were related to conversational computing rates. Terms defined were documentation, characters (not in number of bits), storage unit definitions for programs and data, special services, and timing terminology.

| <u>Definition:</u>                | <u>Number of Vendors:</u> |
|-----------------------------------|---------------------------|
| Connect time or<br>terminal time  | 7                         |
| Central processor<br>time element | 7                         |
| Data storage unit                 | 3                         |

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